

VASCULAR PLANT TYPE SPECIMENS IN THE UNIVERSITY OF BRITISH COLUMBIA HERBARIUM (UBC)

Jeffery M. Saarela¹

*Department of Botany, and
UBC Botanical Garden and Centre for Plant Research
University of British Columbia
Vancouver, British Columbia, CANADA*

Linda Lipsen

*Department of Botany
University of British Columbia
Vancouver, British Columbia, CANADA
lindaj@interchange.ubc.ca*

Cindy M. Sayre

*VanDusen Botanical Garden
5251 Oak Street
Vancouver, British Columbia, CANADA*

Jeannette Whitton

*Department of Botany
University of British Columbia
Vancouver, British Columbia, CANADA
jwhitton@interchange.ubc.ca*

ABSTRACT

We provide a brief a history of the University of British Columbia herbarium and its vascular plant collection, and a catalogue of vascular plant type specimens in UBC.

RESUMEN

Se aporta una breve historia del herbario de la Universidad de la Columbia Británica y su colección de plantas vasculares, y un catalogo de tipos de plantas vasculares en UBC.

INTRODUCTION

General Collection History

The University of British Columbia Herbarium (UBC; Holmgren & Holmgren 1990) is the largest herbarium in western Canada, with approximately 600,000 accessioned specimens, including 242,000 bryophytes, 222,000 vascular plants, 67,000 algae, 35,000 lichens, and 15,000 fungi. John Davidson initiated the collection in 1912, when he became the Provincial Botanist of British Columbia. The original herbarium (not affiliated with UBC at the time) was located in the botanical offices in downtown Vancouver, and subsequently moved to a number of downtown locations before being moved to a temporary UBC location at Fairview in 1916, when John Davidson became “the demonstrator in charge of UBC herbarium and botanical garden.” The collections were moved to the university campus around 1925, and were housed in various buildings closest to their curators, with the vascular plant collection located in what is now the Geology building (D. Brownstein, pers. comm.). In 1973, all five collections were moved to their present location in the Biological Sciences building. The collection will soon move again to the Beatty Biodiversity Museum, along with all the other non-anthropological UBC natural history collections.

History of the Vascular Plant Collection

Although details of the early growth of the vascular plant collection are unknown, it is well documented that many early British Columbia collectors donated their entire collections to John Davidson. Substantial early additions to the herbarium collection were donated by: Albert J. Hill (UBC database collecting years: 1875–1912; 2,500 specimens from various families, mostly from British Columbia); Eli Wilson (1903–1913; >1,000 specimens from various families, all from BC); W. Taylor (1912–1937; 900 specimens from various families, all BC); and A.E. Baggs (1910–1929; 1,000 specimens from BC and England) (The University of

¹Corresponding author and Current Address: Research Division, Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, Ontario, CANADA, jsaarela@mus-nature.ca

British Columbia Calendar 1922-1923; UBC database). Much of the early collection was destroyed during the 1930s by insect damage (W. Schofield, D. Brownstein, pers. comm., September 2006).

The size of the vascular plant collection increased substantially over the following decades, as a result of the efforts of many collectors and exchanges with other institutions. The collection included ~8,000 accessioned sheets in 1915, ~37,000 by 1952, 177,000 in the 1980s, and 212,000 in 1990. At present, the collection includes more than 222,000 accessioned specimens. Many of the largest donated collections of vascular plants have been from former directors of the UBC herbarium [J.W. Eastham (UBC database collecting years: 1948–1965; ~10,000 specimens from various families, all from B.C., with an emphasis on Poaceae and Cyperaceae); T.M.C. Taylor (1966–1971; ~7,000 specimens from various families, collected in Canada, Europe, and Japan, with an emphasis on pteridophytes); K.I. Beamish (1972–1974; ~6,500 specimens from various families, from Canada (B.C. and Yukon), Australia, and Tasmania, with an emphasis on Saxifragaceae and *Dodecatheon*); G.B. Straley (1990–1996; ~6,000 specimens, mainly from B.C. and U.S.A., with an emphasis on cultivated species)]. Additional large collections have been provided by U.B.C. faculty members [V.J. Krajina (1949–1975; ~10,000 specimens, mainly from B.C. and Hawaii, with an emphasis on pteridophytes), W.B. Schofield (1964–present; 1,500 specimens, mainly from western Canada (B. C. and Yukon) and Alaska], herbarium staff [J. Pinder-Moss (1968–1976; ~1,000 specimens from various families, all B. C.)], local botanists [e.g., J.A. Calder (1954–1964; 2,200 specimens, mainly from B.C.)], past graduate students [J. Pojar (1969–1975; ~800 specimens, mainly from B.C.)], and herbarium demonstrators, such as John Davidson (1916–1948; ~2,500 specimens from B.C. and Scotland). Current active collectors for the UBC herbarium are: H. Kennedy (1969–present; 1,000 specimens, mainly from South America, with an emphasis on Marantaceae); T. Goward (1979–present; 1,500 specimens, mainly from B.C.); A. Ceska (1978–present; 1,200 specimens, mainly from B.C., with an emphasis on Cyperaceae, Juncaceae, and aquatic species “whose flowers measure < 1 cm in diameter” (Adolf Ceska, pers. comm., December 2006); and F. Lomer (1988–present; ~2,000 specimens, mainly from B.C., from various families).

Of the 222,000 vascular plant specimens in UBC, ~45% are from British Columbia, and 22% are from the rest of Canada, with the Northwest Territories and Yukon Territory especially well represented. Specimens from the United States make up about 16% of the collection, with 9% from the five Pacific Coast states (Alaska, California, Hawaii, Oregon, and Washington) and 7% from the remainder of the United States. Hawaiian plants are especially well represented. About 17% of the collection originates from the rest of the world, with the largest numbers from Great Britain, Finland, China, Australia, Denmark, Japan, South Africa, Taiwan, Russia, Greenland, and Sweden.

UBC Type Collection

Until recently, most vascular plant type specimens in UBC were integrated with the general collection. We have searched the collection in an attempt to find all type specimens, though it is possible that additional type specimens (not clearly labeled as such) remain in the general collection. The composition of the vascular plant type collection largely reflects the geographic location of the herbarium and taxonomic groups of interest to researchers that are or have been associated with the UBC herbarium [e.g., studies of the neotropical genus *Calathea* (Marantaceae) by Dr. Helen Kennedy]. We have located 89 type specimens (excluding paratypes and topotypes), including seven holotypes, one isoneotype, and 81 isotypes. The geographic regions represented by the type specimens include 11 countries, eight states in the U.S.A (mostly western), three Canadian provinces, and one Canadian territory.

In this paper, we present comprehensive data for all known type specimens in UBC, including family, taxonomic name, authority, place and date of original publication, type status, country, collection locality information, habitat, collector(s), collection number, and UBC herbarium accession number. Specimens are listed alphabetically under their respective families. We have carefully examined all of the original protologues and specimens to confirm the status of type specimens. In many instances, protologue data differ from specimen label data. To provide maximum information, we therefore present all relevant protologue and specimen label data; in most cases, morphological data included on labels or in protologues are not

included here. To maintain consistency throughout the manuscript, we have altered the formatting of some of the original data. Additional isotypes for several collections presented here are deposited in the United States National Herbarium (US); we include this information with the protologue data, identified with an asterisk (*) if US was not listed as a specimen repository in the original protologue. In an appendix, we provide an index to collectors and collector numbers, based on data from the UBC specimens. Authority abbreviations and publication citations follow Lawrence et al. (1968), Brummitt and Powell (1991), and Bridson and Smith (1991). This is the first published account of the UBC vascular plant type specimens, and it makes information on these historical collections available to the global botanical community to facilitate taxonomic work. All type specimens have been scanned, and high resolution images are available on the UBC herbarium webpage (<http://www.botany.ubc.ca/herbarium>).

CATALOGUE OF THE VASCULAR PLANT TYPE SPECIMENS IN THE UBC HERBARIUM

APIACEAE

Lomatium stebbinsii Schlessman & Constance, Madrono 26:41. 1979. **T-Protologue:** U.S.A. CALIFORNIA. Tuolumne Co.: 4 mi (6.4 km) E of Long Barn on NE side of Bald Mountain, S2 T3N R17E, gravelly open volcanic slope and ridge crest with *Allium*, *Calyptidium*, *Arabis*, *Crepis*, *Penstemon*, and *Ceanothus*; *Pinus ponderosa* association; peduncles spreading, nearly prostrate, fruits shining, heavily grazed by rabbits, 4100 ft (1242 m), 26 May 1978, Constance 3895 (HOLOTYPE: WTU; ISOTYPES: NY, UC, WS, US*). **T-Specimen:** CALIFORNIA. Tuolumne Co.: Sierra Nevada, 4 mi E of Long Barn on NE side of Bald Mountain (Sect. 2, Twns. 3N, R 17E), ca. 5600 ft elev., gravelly open volcanic slope and ridge crest with *Allium*, *Calyptidium*, *Arabis*, *Crepis*, *Penstemon* and *Ceanothus*, *Pinus ponderosa*-*Calocedrus* association, 26 May 1978, L. Constance 3895 (ISOTYPE: UBC-V170207).

ASTERACEAE

Blennosperma bakeri Heiser, Madrono 9:103. 1947. **T-Protologue:** CALIFORNIA. Sonoma Co.: W outskirts of Sonoma in “hog wallow” ca. 0.25 mi S of Napa Street in field on E side of street, 2 Apr 1946, M.S. Baker 11307 (Herbarium of the University of California no. 72576; isotypes are to be distributed widely; US*). **T-Specimen:** CALIFORNIA. Sonoma Co.: W outskirts of Sonoma in “hog wallow” ca. 0.25 mi S of Napa Street in field on E side of street, 2 Apr 1946, M.S. Baker 11307 (ISOTYPE: UBC-V95320).

Helianthus nuttallii Torr. & A. Gray subsp. **canadensis** R.W. Long, Brittonia 18:77. 1966. **T-Protologue:** MANITOBA: District de Souris, Mont Tortue, 1 mi de Mountain Side Fosse, Boivin and Alex 10245 (HOLOTYPE: DAO). **T-Specimen:** MANITOBA: District de Souris, Mont Tortue, 1 mi au nord de Mountain Side Fossé, 25 Aug 1952, Bernard Boivin and J.F. Alex 10245 (ISOTYPE: UBC-V155305).

Microseris laciniata (Hook.) Sch. Bip. subsp. **detlingii** K.L. Chambers, Sida 21:200. 2004. **T-Protologue:** U.S.A. OREGON. Jackson Co.: Siskiyou Pass, S side on the old highway where it joins Hwy. 5, 2.1 mi N of Hilt exit, grassy openings in *Quercus breweri*/*Amelanchier pallida* brushland, in heavy clay soil on slope above road, 22 Jun 1967, K. L. Chambers 2868 (HOLOTYPE: OSC; ISOTYPES: BRIT-SMU, CAS, MO, NY, RSA, UC, US, WS, WTU). **T-Specimen:** U.S.A. OREGON. Jackson Co.: Siskiyou Pass, slope to E of the old highway, where it joins the new freeway (Hwy. 5), 2.1 mi N of the Hilt exit, R2E, T41S, Sec. 8, 3750 ft, 22 Jun 1967, K. L. Chambers 2868 (ISOTYPE: UBC-V220903).

Solidago xbernardii B. Boivin, Phytologia 23:21. 1972. **T-Protologue:** Kleefeld, 1.5 mi au sud-est, prairie, 16 Aug 1958, Boivin, Bernard & Perron 12942 (HOLOTYPE: DAO). **T-Specimen:** MANITOBA: District de Provencher, Kleefeld, 1.5 mi au sud-est, prairie, ligules jaunes, devenant blanches, 16 Aug 1958, B. Boivin, J.-P. Bernard, and J.M. Perron 12942 (ISOTYPE UBC-V155279).

BRASSICACEAE

Cardamine oligosperma Nutt. var. **lucens** G.S. Torr., Rhodora 17:157. 1915. **T-Protologue:** Klickitat Co.: damp places, common at Bingen, Suksdorf 7452 (HOLOTYPE: GH). **T-Specimen:** WASHINGTON. Klickitat Co.: Bingen, near my house, 10, 12 Apr 1912, Wilhelm N. Suksdorf 7452 (ISOTYPE: UBC-V150824).

CARYOPHYLLACEAE

Silene andersonii Clokey, Bull. S. Calif. Acad. Sci. 38:2. 1939. **T-Protologue:** NEVADA. Clark Co.: Charleston Mountains, on a steep, N slope in Lovell Canyon, associated with *Cercocarpus lepidifolius* Nutt. and *Artemisia tridentata* Nutt., 2,600 m, 9 Aug 1937, Clokey 7514 (HOLOTYPE: Clokey Herbarium; ISOTYPES: CAS, US*). **T-Specimen:** NEVADA. Clark Co.: Levell [sic] Canyon, steep, N, gravelly slope with *Artemisia tridentata* Nutt and *Cercocarpus ledifolius* Nutt., 2600 m, 9 Aug 1937, I.W. Clokey 7514 (ISOTYPE: UBC-V111762).

CHENOPODIACEAE

Corispermum hookeri Mosyakin, Novon 5:349. 1995. **T-Protologue:** CANADA. SASKATCHEWAN: District de Moose Jaw, palier sablonneux au pied du Coteau du Missouri, 5–6 mi à l'est de Mortlach, dune éventrée, 11 Sep 1960, B. Boivin & G.F. Ledingham 14079 (HOLOTYPE: DAO; ISOTYPES: NY, TRT, UBC). **T-Specimen:** CANADA. SASKATCHEWAN: District de Moose Jaw, palier sablonneux au pied du Coteau du Missouri, 5–6 mi à l'est de Mortlach, dune éventrée, 11 Sep 1960, B. Boivin and G.F. Ledingham 14079 (ISOTYPE: UBC-V155271).

Corispermum hookeri Mosyakin var. **pseudodeclinatum** Mosyakin, Novon 5:350. 1995. **T-Protologue:** CANADA. BRITISH COLUMBIA: beside Burnaby Lake, sand dune, 3 Oct 1965, I. Bayly 83 (HOLOTYPE: UBC). **T-Specimen:** CANADA. BRITISH COLUMBIA: beside Burnaby Lake, sand dune, 3 Oct 1965, I. Bayly 83 (HOLOTYPE: UBC-V190492).

CYPERACEAE

Carex raymondii Calder, Rhodora 54:246. 1952. **T-Protologue:** MANITOBA: Gillam, moist soil along margins of wood-road, *Schofield 1270* (HOLOTYPE: DAO). **T-Specimen:** CANADA. MANITOBA: Churchill District, Gillam, 27 Jul 1950, W.B. *Schofield 1270* (ISOTYPE: UBC-V40731).

Fimbristylis spathacea Roth var. **depauperata** T. Koyama, J. Jap. Bot. 30:1. 1955. **T-Protologue:** Honshu, côté d'Ichinomiya dans la prov. de Kadzusa, *T. Koyama 11120* (HOLOTYPE: TSM). **T-Specimen:** JAPAN: Honshu, Kadzusa, Ichinomiya coast, scattered in stable dune sands sheltered by *Pinus thunbergii*, 11 Sep 1954, *T. Koyama 11120* (ISOTYPE: UBC-V102843).

DRYOPTERIDACEAE

Woodsia phillipsii Windham, Contr. Univ. Michigan Herb. 19:50. 1993. **T-Protologue:** U.S.A. ARIZONA. Cochise Co.: Rucker Canyon, Chiricahua Mts, canyon sides in pine woods, 6500 ft, 7 Oct 1945, *Phillips 2854* (HOLOTYPE: GH; ISOTYPES: ARIZ, ASC, UBC, US). **T-Specimen:** ARIZONA. Cochise Co.: Rucker Canyon, Chiricahua Mts, 6500 ft, 7 Oct 1945, *Walter S. Phillips 2854* (ISOTYPE: UBC-V5012).

EQUISETACEAE

Equisetum variegatum Schleich. var. **nelsonii** A.A. Eaton, Fern Bull. 12:41. 1904. **T-Protologue:** ILLINOIS: E Chicago, along a canal, *N.L.T. Nelson s.n.* (HOLOTYPE: not specified; ISOTYPE: US*). **T-Specimen:** ILLINOIS: east Chicago, Jun 1901, *N.L.T. Nelson 85* (ISOTYPE: UBC-V3681).

FABACEAE

Oxytropis campestris DC. var. **wanapum** Joyal, Great Basin Naturalist 50:373. 1990. **T-Protologue:** U.S.A. WASHINGTON. Grant Co.: Saddle Mountain, above Lower Crab Creek and E of Beverly, T15N, R24E, S2, N1/2, elev. ca. 550 m, NNE aspect at crest of ridge, in sandy (volcanic ash) soils above steep basalt talus, 25 May 1987 (flower and early fruit), *Joyal 1264* (HOLOTYPE: US; ISOTYPES: BRY, CAN, CAS, ISC, K, MO, MONTU, NY, OSC, S, UBC, WS, WTU). **T-Specimen:** WASHINGTON. Grant Co.: Saddle Mountain, above Lower Crab Creek, sandy ridge above steep N-facing basalt talus, T15N, R24E, Sec 2 N½, ca. 600 m, common on sandy (volcanic ash) soils, 25 May 1987, *Elaine Joyal 1264* (ISOTYPE: UBC-V201206).

Oxytropis sordida (Willd.) Persoon subsp. **murrayi** Jurtsev, Arctic Fl. U.S.S.R 9:179. 1986. **T-Protologue:** YUKON: St. Elias Mts., Observation Mt. and vicinity, at terminus of Kaskawulsh Glacier, *D. F. and B. M. Murray 522*, 1966 (HOLOTYPE: LE; ISOTYPES: ALA, BRY). **T-Specimen:** CANADA. YUKON TERR.: St. Elias Mts., Observation Mt. and vic., at terminus, Kaskawulsh Glacier, ridge crest, 5500–7000 ft., 60° 40' N, 138° 44' W., 10 Jul 1966, *David F. and Barbara M. Murray 522* (ISOTYPE: UBC-V173554).

GESNERIACEAE

Cyrtandra campaniformis St. John, Bernice P. Bishop Mus. Bull. 229:54. 1966. **T-Protologue:** Oahu, Laie Trail, Kahawainui Gulch, in moist *Metrosideros* forest, 1,250 ft, 25 Mar 1956, *H. St. John 25960* (HOLOTYPE: BISH). **T-Specimen:** U.S.A. HAWAIIAN ISLANDS, Laie Trail, Kahawainui Gulch, 381 m, in moist *Metrosideros* forest, 25 Mar 1956, *St. John 25960* (ISOTYPE: UBC-V38956).

Cyrtandra kailuaensis St. John, Bernice P. Bishop Mus. Bull. 229:172. 1966. **T-Protologue:** Oahu, Kailua, Fourth South Fork of the South Fork of Kahanaiki Stream, open scrub of guava, *Perrotettia*, kukui, *Rubus*, 800 ft, 18 Sep 1955, *G. Pearsall 2* (HOLOTYPE: BISH). **T-Specimen:** U.S.A. HAWAIIAN ISLANDS: Kailua, Fourth South Fork of Kahanaiki Stream, 244 m, 18 Sep 1950, *Pearsall 2* (ISOTYPE: UBC-V45207).

Note.—The collection date on the UBC specimen is incorrectly listed as 18 Sep 1950.

Cyrtandra pearsallii St. John, Bernice P. Bishop Mus. Bull. 229:269. 1966. **T-Protologue:** Oahu, Kailua, fourth south fork of the South Fork of Kahaniki Stream, 800 ft, open scrub of guava, *Clermontia*, *Rubus*, at base of large rock, 18 Sep 1955, *G. Pearsall 4* (HOLOTYPE: BISH; ISOTYPE: US*). **T-Specimen:** U.S.A. HAWAIIAN ISLANDS: Fourth South Fork of the South Fork of Kahanaiki Stream, Kailua, open scrub of guava, *Clermontia*, *Rubus*, at base of large rock, 244 m, 18 Sep 1950, *Pearsall 4* (ISOTYPE: UBC-V45209).

Note.—The collection date on the UBC specimen is incorrectly listed as 18 Sept 1950.

JUNCACEAE

Juncus laccatus Zika, Preslia 74:261. 2002. **T-Protologue:** U.S.A. WASHINGTON. Clallam Co.: low W ground, S side of Route 101 near Dry Creek and Dry Creek Road, 6 air km SSE of Angeles Point, Olympic Peninsula, 140 m, 48°06'N, 123°31'W, 27 Sep 2001, *P.F. Zika 16611* (HOLOTYPE: WTU; ISOTYPES: CAN, GH, MICH, MO, NY, OSC, PRA, UBC, UC, US). **T-Specimen:** WASHINGTON. Clallam Co.: S side of Route 101 near Dry Creek and Dry Creek road, 6 air km SSE of Angeles Point, Olympic Peninsula, low wet ground, full sun, with *Juncus hesperius*, *J. ensifolius*, *Lotus corniculatus*, *Alnus rubra*, 140 m, T30N R8W S22, 48°6' N, 123°31' W, 27 Sep 2001, *P.F. Zika 16611* (ISOTYPE: UBC-V219821).

LAURACEAE

Licaria applanata van der Werff, Novon 4:65. 1994. **T-Protologue:** ECUADOR: Pichincha, Reserva Río Guajalito, near Chiriboga, along old road Quito-Sto. Domingo, 1,850 m, *van der Werff et al. 12194* (HOLOTYPE: MO; ISOTYPES: AAU, GB, HBG, K, NY, P, QCNE, QRS, US). **T-Specimen:** ECUADOR: Pichincha, Reserva Río Guajalito, near Chiriboga, along old road Quito-St. Domingo, montane forest, Lauraceae collected in pature, 1850 m, 5 Jul 1991, *H. van der Werff, B. Gray, G. Tipas, and J. Campaña 12194* (ISOTYPE: UBC-V211491).

Ocotea rugosa van der Werff, Novon 4:70. 1994. **T-Protologue:** ECUADOR: Bolívar, in small patches of disturbed cloud forest along first 15 km of road Chillanes-El Tambo, elev. 2,100 m, *van der Werff et al. 12429* (male fl) (HOLOTYPE: MO; ISOTYPES: AAU, GB, NY, QCNE, QRS, US). **T-Specimen:** ECUADOR: Bolivar, small patches in disturbed cloud forest, rather dry, along first 15 km of road Chillanes-El Tambo, 2400 m, 18 Jul 1991, *H. van der Werff, B. Gray, and G. Tipas 12429* (ISOTYPE: UBC-V211489).

LILIACEAE

Erythronium quinaultense G.A. Allen, Syst. Bot. 26:269. 2001. **T-Protologue:** U.S.A. WASHINGTON. Grays Harbor Co.: Higley Peak, W side of summit, openings in coniferous forest, T23°N R10°W sect. 1, elev. 800 m, 24 May 1996, *Allen 9603* (HOLOTYPE: UVIC; ISOTYPES: WTU, OSC). **T-Specimen:** WASHINGTON: Grays Harbor Co.: Olympic National Forest, W side of Higley Peak along FS road #2190, S of short trail to summit, rocky ledges and openings in coniferous forest and adjacent road cutbacks on W facing slope, 2620 ft, T23N R10W sect. 1, 24 May 1996, *G.A. Allen 9603* (ISOTYPE: UBC-V218119).

MALVACEAE

Hibiscus newhousei Roe, Pacific Sci. 15:22. 1961. **T-Protologue:** Kauai, Moloaa Forest Reserve, ca. 500 ft altitude, 10 Nov 1958, *I.E. Lane 44* (HOLOTYPE: not specified). **T-Specimen:** HAWAII: Kauai Island, Moloaa Forest Reserve, medium forest, “headwall,” 150 m, 22.2N 159.6W, 10 Nov 1958, *I.E. Lane 44* (ISOTYPE: UBC-V183389a).

MARANTACEAE

Calathea amazonica H. Kenn., Selbyana 15:63. 1994. **T-Protologue:** PERU. DEPT. AMAZONAS: Rio Cenepa vicinity of Huampami, ca. 5 km E of Chávez Valdivia, en bosque secundario, 200-250 m, ca. 04°30'S, 78°30'W, 1978, *E. Ancuash 1142* (HOLOTYPE: MO; ISOTYPE: UBC). **T-Specimen:** PERU. DEPT. AMAZONAS: Río Cenepa, vicinity of Huampami, ca. 5 km E of Chávez Valdivia, ca. 78°30' W, 4° 30'W, 200-250 m; gruesa hierba 30 cm, hojas pubescentes, flores blancas, en bosque secundario, no tiene usa; 1978, *Ernesto Ancuash 1142* (ISOTYPE: UBC-V208550).

Calathea anderssonii H. Kenn., Canad. J. Bot 63:1145. 1985. **T-Protologue:** ECUADOR: Napo, 15 km W of Tena along the Tena-Pamo road (road to Salcedo), along stream bank, 550 m, 19 Jul 1982, *Kennedy, Besse and Baker 4383* (HOLOTYPE: NY; ISOTYPES: AAU, BH, GB, QCA, SEL, UBC). **T-Specimen:** ECUADOR. PROV. NAPO: 15 km W of Tena along the Tena-Pano road (road to Salcedo), along stream bank, 550 m, 19 Jul 1982, *Helen Kennedy, Libby Besse, and Ray Baker 4383* (ISOTYPE: UBC-V218518, 1 of 4; UBC-V183369, 2 of 4, UBC-V218519, 3 of 4; UBC-V218520, 4 of 4).

Calathea annae H. Kenn. & Marcelo, Phytologia 82:96. 1997. **T-Protologue:** Cultivated at Sítio Roberto Burle Marx, Barra de Guaratiba, Edo. Rio de Janeiro, Brazil, accession number MAR-1, from Brazil, Edo, unknown, 11 Jan 1991, *H. Kennedy and M. de F. Gomes de Souza 4696* (HOLOTYPE: RB; ISOTYPES: K, RB, Sítio RBM, UBC). **T-Specimen:** BRASIL: cultivado no Sítio Roberto Burle Marx, Barra de Guaratiba, Edo. Rio de Janeiro, 11 Jan 1991, *Helen Kennedy and M. de Fátima Gomes de Souza 4696* (ISOTYPE: UBC-V207963, 1 of 2; UBC-V207964, 2 of 2).

Note.—The UBC specimen is labeled *Calathea annae* H. Kenn. and Braga, but the taxon was described as *Calathea annae* H. Kenn & Marcelo.

Calathea anulque H. Kenn., Fl. Ecuador 32:38. 1988. **T-Protologue:** ECUADOR: Carchi, environs of Maldonado, 1450-1650 m, 2 Jun 1978, *Madison, Plowman, Kennedy and Besse 4949* (HOLOTYPE: SEL; ISOTYPES: AAU, F, QCA, UBC). **T-Specimen:** ECUADOR. PROV. CARCHI: environs of Maldonado, wet montane forest, elev. 1450–1650 m, 2 Jun 1978, *M.T. Madison, T.C. Plowman, H. Kennedy, and L. Besse 4949* (ISOTYPE: UBC-V190301, 1 of 3; UBC-V190299, 2 of 3; UBC-V190300, 3 of 3).

Calathea attenuata H. Kenn., Nord. J. Bot. 6:146. 1986. **T-Protologue:** COLOMBIA: Amazonas, Leticia, 8 km out of Leticia along the road past airport, near Finca Vega, rain forest, 7 Feb 1972, *Kennedy and Andrews 1343* (HOLOTYPE: MO; ISOTYPES: AAU (sterile), COL, GB, NY, UBC). **T-Specimen:** COLOMBIA: Amazonas, Leticia, ca. 5 km out of Leticia on the road past the airport, disturbed rain forest, 7 Feb 1972, *Helen Kennedy and Robin Andrews 1343* (ISOTYPE: UBC-V184199).

Calathea caquetensis S. Suárez & Galeano, Caldasia 9:12. 2000. **T-Protologue:** COLOMBIA: Amazonas, río Yari, margen oriental, cerca a su desembocadura en el río Caquetá, 0° 34' S, 72° 20' W, ca. 200 m, 13 Jun 1991, *G. Galeano et al. 2829* (HOLOTYPE: COAH; ISOTYPES: COL, UBC). **T-Specimen:** COLOMBIA. DEPARTAMENTO DE AMAZONAS: Río Yari, margen izquierdo bajando, cerca a su desembocadura en el Río Caquetá, 13 Jun 1991, *G. Galeano, X. Martínez, and S. Suárez 2829* (ISOTYPE: UBC-V215100).

Calathea clivorum H. Kenn., Canad. J. Bot. 63:1147. 1985. **T-Protologue:** ECUADOR: Napo, 20 km W of Tena along the Tena-Pano road from Tena (road to Salcedo), 550 m, 19 Jul 1982, *Kennedy, Besse and Baker 4368* (HOLOTYPE: K; ISOTYPES: AAU, GB, M, MO, QCA, SEL, U, UBC, US). **T-Specimen:** ECUADOR. PROV. NAPO: 20 km W of Tena along the Tena-Pano road from Tena (road to Salcedo), growing on a nearly vertical cliff face, 550 m, 19 Jul 1982, *Helen Kennedy, Libby Besse and Ray Baker 4368* (ISOTYPE: UBC-V183370).

Calathea compacta S. Suárez & Galeano, Caldasia 22:12. 2000. **T-Protologue:** COLOMBIA: Amazonas, río Caquetá, margen sur, Puerto Asaí, frente a Dos Islas, 0°55' S, 71°38' W, ca. 200 m, 4 Jun 1991, *G. Galeano et al. 2711* (HOLOTYPE: COAH; ISOTYPE: COL, UBC). **T-Specimen:** COLOMBIA. DEPARTAMENTO DE AMAZONAS: Río Caquetá, margen sur, Puerto Asaí frent a Dos Isla, en cercanía de la casa de Alfonso Rodríguez, *G. Galeano, X. Martínez, and S. Suárez 2711* (ISOTYPE: UBC-V215101).

Calathea contrafenestra H. Kenn., Canad. J. Bot. 62:18. 1984. **T-Protologue:** Cultivated at Marie Selby Botanical Garden, Sarasota, Florida, from rhizomes collected in Limnococho, Ecuador (*M.T. Madison, T.C. Plowman, and L. Besse 5400*), 18 Jun 1982, *H. Luger [sic] 800* (HOLOTYPE: SEL; ISOTYPES: BH, US). **T-Specimen:** Cultivated, Marie Selby Botanical Garden, Sarasota, Florida, from rhizomes collected in Ecuador, Limoncocha, Napo, Ecuador (*Madison, Plowman, and Besse 5400*), 18 Jun 1982, *Luther 800* (ISOTYPE: UBC-V184263, 1 of 2; UBC-V184262, 2 of 2).

Calathea curaraya H. Kenn., Fl. Ecuador 32:128. 1988. **T-Protologue:** ECUADOR: Napo, road (under construction) Coca-Cononaco, c. 30 km S of Río Tiputini, 200 m, 23 Jan 1982, *Harling, Bohlin, Lindström & Roth 19833* (HOLOTYPE: GB; ISOTYPE: UBC). **T-Specimen:** ECUADOR: Coca, Coca-Cononaco Road (in construction), ca. 30 km S of Río Tiputini, 200 m, 23 Jan 1982, *G. Harling, J.-E. Bohlin, Marie Lindström, and Suzanne Roth 19833* (ISOTYPE: UBC-V202966).

Calathea ecuadoriana H. Kenn., *Canad. J. Bot.* 62:15. 1984. **T-Protologue:** U.S.A. HAWAII: Honolulu, cultivated at Lyon Arboretum, 1 Jun 1982, *H. Kennedy* 4224 (HOLOTYPE: US; ISOTYPES: BH, CAN, HLA, K, M). **T-Specimen:** U.S.A. HAWAII: Honolulu, Lyon Arboretum, 1 Jun 1982, *Helen Kennedy* 4224 (ISOTYPE: UBC-V220043).

Calathea fatimae H. Kenn., *Phytologia* 82:94. 1997. **T-Protologue:** BRAZIL: Cultivated at Sítio Roberto Burle Marx, Barra de Guaratiba, Munic. Rio de Janeiro, Edo. Rio de Janeiro, Brazil, accession number MAR-101, from rhizomes collected by *Fátima Gomes de Souza* from Morro do Coco, ca. 40 km N of the city of Campos, Munic do Campos, Edo. De Janeiro, Brazil, flowered in cultivation 11 Jan 1991, *H. Kennedy and M. de F. Gomes de Souza* 4700 (HOLOTYPE: RB; ISOTYPES: K, Sítio RBM, UBC). **T-Specimen:** Cultivado no Sítio Roberto Burle Marx, Barra de Guaratiba, Edo. Rio do Janeiro, Brasil, rhizomes collected by M. F. Gomez de Souza from Morro do Coco, Munic do Campos, Edo. Rio de Janeiro, Brasil, 19 Jan 1991, *Helen Kennedy and M. de Fatima Gomes de Souza* 4700 (ISOTYPE: UBC-V207965, 1 of 2; UBC-V218521, 2 of 2).

Calathea fucata H. Kenn., *Fl. Ecuador* 32:133. 1988. **T-Protologue:** ECUADOR: Napo, Río San Miguel opposite San Miguel, 4 Feb 1971, *Kennedy* 808 (HOLOTYPE: SEL; ISOTYPES: DUKE, QCA, UBC). **T-Specimen:** ECUADOR. NAPO PROV.: Río San Miguel, across river from San Miguel, Putumayo, Colombia, 4 Feb 1971, *Helen Kennedy* 808 (ISOTYPE: UBC-V194073).

Calathea gandersii H. Kenn., *Fl. Ecuador* 32:110. 1988. **T-Protologue:** ECUADOR: Napo, road from Tena to Pano, trail through primary forest from road's end to the sawmill, 760 m, *Davis* 422 (HOLOTYPE: UBC). **T-Specimen:** ECUADOR. PROVINCIO NAPO: road from Tena to Pano, trail through primary forest from roads end to the sawmill, 759 m, 14 Dec 1976, *E. W. Davis* 422 (HOLOTYPE: UBC-V193731).

Calathea gloriana H. Kenn., *Selbyana* 18:35. 1997. **T-Protologue:** COSTA RICA. PROV. HEREDIA: Estación Biológica La Selva, Lindero Sur por las cabeceras de la Quebrada Surá, bosque secundario viejo, ca. 100 m, 19 Jul 1990, *H. Kennedy and B. Hammel* 4545 (HOLOTYPE: CR; ISOTYPES: BM, MO, U, UBC, US). **T-Specimen:** COSTA RICA. PROV. HEREDIA: Cantón de Sarapiquí, estación Biológica La Selva, Lindero Sur por las cabeceras de La Quebrada Surá, bosque secundario, viejo, 100 m, 10°25' 30" N, 84°01'30" W, 19 Jul 1990, *Helen Kennedy and Barry Hammel* 4545 (ISOTYPE: UBC-V211858).

Calathea grazielae H. Kenn. & Marcelo, *Phytologia* 82:101. 1997. **T-Protologue:** BRAZIL: cultivated at Sítio Roberto Burle Marx, Barra de Guaratiba, Munic. Rio de Janeiro, Edo. Rio de Janeir, Brazil, from rhizomes collected in Brazil, Edo. unknown, flowered in cultivation 19 Jan 1991, *H. Kennedy and M. de. F. Gomes de Souza* 4699 (HOLOTYPE: RB; ISOTYPES: K, MO, Sítio RBM, UBC). T- Specimen: BRAZIL: cultivado no Sítio Roberto Burle Marx, Barra de Guaratiba, Edo. Rio de Janeiro, 19 Jan 1991, *Helen Kennedy and M. de Fátima Gomes de Souza* 4699 (ISOTYPE: UBC-V208250, 1 of 2; UBC-V218522, 2 of 2).

Note.—The UBC specimen is labeled *Calathea grazielae* H. Kenn. and J. M. Braga (the latter authority written by hand after the label was printed). The taxon was described as *Calathea grazielae* H. Kenn. & Marcelo.

Calathea hylaeanthoides H. Kenn., *Canad. J. Bot.* 75:1356. 1997. **T-Protologue:** COSTA RICA. PUNTARENAS PROV.: Cantón de Osa, Osa Peninsula, Reserva Forestal Golfo Dulce, in Rancho Quemado Valley along Quebrada Quebradón and the Río Riyito, 200 m, 8°40' N, 83°34' W, 11 Sep 1990, *H. Kennedy, B. Hammel, and J. Solomon* 4664 (HOLOTYPE: CR; Isotypes: BM, COL, DUKE, F, G, GB, INB, K, MA, MICH, MO, P, U, UBC, US). **T-Specimen:** COSTA RICA. PUNTARENAS PROV.: Cantón de Osa, Osa Peninsula, Reserva Forestal Golfo Dulce, in Rancho Quemado Valley along Quebrada Quebradón and the Río Riyito, 200 m, 8°40'N, 83°34'W, 11 Sep 1990, *Helen Kennedy, Barry Hammel, and James Solomon* 4664 (ISOTYPE: UBC-V211818, 1 of 2; UBC-V211817, 2 of 2).

Calathea incompta H. Kenn., *Canad. J. Bot.* 75:1361. 1997. **T-Protologue:** COSTA RICA. PUNTARENAS PROV.: Cantón de Osa, Osa Peninsula, 2.5 mi SW of Rincón, by Río Agua Buena, above the airfield, tropical wet forest, 15-30 m, 8°32' N, 83°29' W, 4 Sep 1971, *H. Kennedy* 1139 (HOLOTYPE: UBC; ISOTYPES: CR, K, MO, US). **T-Specimen:** COSTA RICA. PUNTARENAS PROV.: Cantón de Osa, Osa Peninsula, 2.5 mi SW of Rincón, by Río Agua Buena, above the airfield, 15-30 m, 8°32' N, 83°29' W, tropical wet forest, 4 Sep 1971, *Helen Kennedy* 1139 (HOLOTYPE: UBC-V204768, 1 of 3; V218523, 2 of 3; V218524, 3 of 3).

Calathea lagoagriana H. Kenn., *Nord. J. Bot.* 6:148. 1986. **T-Protologue:** ECUADOR. NAPO PROV.: 33 km S of Río Aguarico on the road from Lago Agrio to Coca, wet tropical forest, 2 Jul 1982, *Kennedy, Besse, and Baker* 4288 (HOLOTYPE: NY; ISOTYPES: GB, K, MO, SEL, UBC, WIS). **T-Specimen:** ECUADOR. NAPO PROV.: 33 km S of Río Aguarico on the road from Lago Agrio to Coca, wet tropical forest, ca. 350 m, 2 Jul 1982, *Helen Kennedy, Libby Besse, and Ray Baker* 4288 (ISOTYPE: UBC-V189968).

Calathea lanicaulis H. Kenn., *Canad. J. Bot.* 63:1143. 1985. **T-Protologue:** ECUADOR: Napo, 5.6 km along the Tena-Pano road from Tena, disturbed tropical rain forest, ca. 500 m, 17 Jul 1982, *Kennedy, Besse and Baker* 4373 (HOLOTYPE: NY; ISOTYPES: AAU, BH, GB, K, MO, QCA, SEL, U, UBC). **T-Specimen:** ECUADOR. PROV. NAPO: 5.6 km along the Tena-Pano road from Tena, disturbed tropical rain forest, ca. 500 m, 17 Jul 1982, *Helen Kennedy, Libby Besse, and Ray Baker* 4373 (ISOTYPE: UBC-V218525, 1 of 4; UBC-V183368, 2 of 4; UBC-V218526, 3 of 4; UBC-V218527, 4 of 4).

Calathea latrinotecta H. Kenn., *Fl. Ecuador* 32:42. 1988. **T-Protologue:** ECUADOR: Carchi, Penas Blancas, 20 km below Maldonado on Río San Juan, 900-1000 m, *Madison, Plowman, Kennedy, and Besse et al.* 4646 (HOLOTYPE: SEL; ISOTYPES: AAU, F, QCA, UBC). **T-Specimen:** ECUADOR. PROV. CARCHI: Pénas Blancas, 20 km below Maldonado on the Río San Juan, wet montane forest, elev. 900-1000 m, 27 May 1978, *M.T. Madison, T.C. Plowman, H. Kennedy, and L. Besse* 4646 (ISOTYPE: UBC-V218579, 1 of 4; UBC-V190304, 2 of 4; UBC-V218578, 3 of 4; UBC-V218580, 4 of 4).

Calathea liesneri H. Kenn., *Novon* 3:49. 1993. **T-Protologue:** VENEZUELA: Territorio Federal Amazonas, Depto. Atabapo, in saddle between Cerro Duida and Cerro Marahuaca near base of Cerro Duida, medium height forest, 1,000 m, 03°34'N 65°32'W, 25 Oct 1988, *Liesner* 25333 (HOLOTYPE: MO; ISOTYPES: K, UBC, VEN). **T-Specimen:** VENEZUELA: Amazonas, Atabapo, in saddle between Duida and Marahuaca near base of Duida, 1000 m, 03°34'N 65°32'W, 25 Oct 1988, *Ronald Liesner* 25333 (ISOTYPE: UBC-V218528).

Calathea maasiorum H. Kenn., *Brittonia* 47:156. 1995. **T-Protologue:** FRENCH GUIANA: Saül, vicinity of Eaux Claires, Sentier

Botanique, from entrance to 450 m from entrance, non-flooded moist forest, ca. 250-350 m, 03°37'N 53°12'W, 10 Feb 1993, *Mori, Maas, & Mass et al.* 22909 (HOLOTYPE: NY; ISOTYPES: CAY, NY, U, UBC). **T-Specimen:** FRENCH GUIANA: Saül, vicinity of Eaux Claires, Sentier Botanique, from entrance to 450 m from entrance, ca. 250-350 m, 3°37'N, 53°12'W non-flooded moist forest, 10 Feb 1993, *S. Mori, C. Gracie, T. Croat, H. Maas, P. Maas, T. Pennington, and D. Reed* 22909 (ISOTYPE: UBC-V208553).

Calathea neblinensis H. Kenn., *Phytologia* 69:373. 1990. **T-Protologue:** VENEZUELA: Amazonas, Dept. Río Negro, near Cerro de La Neblina Base Camp which is on Río Mawarinuma, in forest near stream, 140 m, 0° 50' N, 66° 10' W, 5 Feb 1984, *R. L. Liesner* 15662 (HOLOTYPE: MO; ISOTYPES: F, NY). **T-Specimen:** VENEZUELA: Territorio Federal Amazonas, Dept. Río Negro, near Cerro de La Neblina Base Camp which is on Río Mawarinuma, elev. 140 m, 0°50' N, 66°10' W, 5 Feb 1984, *Ronald Liesner* 15662 (ISOTYPE: UBC-V217000).

Calathea pallidicosta H. Kenn., *Nord. J. Bot.* 6:143. 1986. **T-Protologue:** ECUADOR. PASTAZA PROV.: 3 km S from junction with Puyo-Macas road towards Canelos (31 km total from Puyo Cemetery), disturbed tropical rain forest, 870 m, 21 Jul 1982, *Kennedy, Besse and Baker* 4404 (HOLOTYPE: NY; ISOTYPES: GB, SEL, UBC). **T-Specimen:** ECUADOR. PROV. PUYO: 3 km S from junction with Puyo-Macas road towards Canelos (31 km total from Puyo Cemetery), disturbed tropical rain forest, 21 Jul 1982, *Helen Kennedy, Libby Besse and Ray Baker* 4404 (ISOTYPE: UBC-V189965, 1 of 3; V218529, 2 of 3; V218530, 3 of 3).

Calathea paucifolia H. Kenn., *Fl. Ecuador* 32:86. 1988. **T-Protologue:** ECUADOR: Pastaza, Río Pacayacu, tributary to Río Bobonaza, SE of Canelos, 10 March 1971, *Lugo* 1605 (HOLOTYPE: GB). **T-Specimen:** ECUADOR: Pastaza, Río Pacayacu, in the vicinity of Canelos, 10 Mar 1971, *Holguer Lugo* S. 1605 (ISOTYPE: UBC-V202967 [2 separate sheets]).

Calathea plurispicata H. Kenn., *Fl. Ecuador* 32:33. 1988. **T-Protologue:** ECUADOR: Napo, road in construction Coca-Curaray, 20-30 km S of Coca, c. 250 m, *Harling and Andersson* 11940 (HOLOTYPE: GB; ISOTYPE: UBC). **T-Specimen:** ECUADOR: Napo, road Coca (Puerto Francisco de Orellana) to Curaray, 20-30 km S of Coca, primary rain forest, alt. ca. 350 m, 13 Nov 1974, *G. Harling and L. Andersson* 11940 (ISOTYPE: UBC-V190302, 1 of 2; UBC-V218531, 2 of 2).

Calathea poeppigiana Loesner ex Kennedy, *Fl. Ecuad.* 32:77. 1988. **T-Protologue:** ECUADOR: Pastaza, tributary to Río Curaray, c. 21 km E of Curaray (Jesus Pitishka), temporary shallow pools in virgin rain forest, c. 200 m, 22 March 1980, *Harling and Andersson* 17592 (HOLOTYPE: GB; ISOTYPE: UBC). **T-Specimen:** ECUADOR: Pastaza, Río Namoyacu ca. 21 km E of Curaray (Jesús Pitishka), virgin rain forest, ca. 200 m, *G. Harling and L. Anderson* 17592 (ISOTYPE: UBC-V203042).

Calathea retroflexa H. Kenn., *Canad. J. Bot.* 75:1357. 1997. **T-Protologue:** COSTA RICA. SAN JOSÉ PROVINCE: Cantón de Pérez Zaledón, San Isidro del General, above La Ese, 3.3 km N of kilometer marker no. 126 on CR route no. 2, ca. 1380 m, 9°26'40" N, 83°43'00" W, 15 Aug 1990, *H. Kennedy* 4555 (HOLOTYPE: CR; ISOTYPES: BM, F, GB, INB, K, MO, U, UBC). **T-Specimen:** COSTA RICA. SAN JOSÉ PROVINCE: Cantón de Pérez Zaledón, San Isidro de General, above La Ese, 3.3 km N of km marker #126 on CR route #2, ca. 1380 m, 9°26'40" N, 83°43'00" W, 15 Aug 1990, *Helen Kennedy* 4555 (ISOTYPE: UBC-V211816).

Calathea robinae H. Kenn., *Ann. Missouri Bot. Gard.* 60:419. 1973. **T-Protologue:** COSTA RICA. LIMÓN PROVINCE: old forest ca. 2 mi from La Lola on the road to Siquirres near stream bed, 26 Feb 1971, *H. Kennedy, H. Andrews & H. L. Dressler* 1379 (HOLOTYPE: F; ISOTYPES: BM, COL, CR, DAV, DUKE, GH, K, MO, NY, U, US). **T-Specimen:** COSTA RICA: Limón, old forest ca. 2 mi from La Lola on the road to Siquirres, near stream bed, *Helen Kennedy, Robin Andrews, and Robert Dressler* 1379 (ISOTYPE: UBC-V204804).

Calathea steyermarkii H. Kenn. & Nagata, *Brittonia* 41:164. 1989. **T-Protologue:** U.S.A. HAWAII: Honolulu, cultivated at Lyon Arboretum, accession # L 76.1230 (from rhizomes collected by H. Kennedy in Parque Nacional Henri Pittier, Edo. Maracay, Venezuela), 5 Apr 1984, *K. Nagata* 2886 (HOLOTYPE: MO; ISOTYPES: HLA, MAY, UBC). **T-Specimen:** Hawaii, Honolulu, cultivated at Lyon Arboretum, accession # L-76.1230 (from rhizomes collected by H. Kennedy in Parque Nacional Henri Pittier, Edo. Maracay, Venezuela), 5 Apr 1984, *Kenneth M. Nagata* 2886 (ISOTYPE: UBC-V203398).

Calathea striata H. Kenn., *Fl. Ecuador* 32:60. 1988. **T-Protologue:** COLOMBIA: Amazonas, Leticia, 8 km out of Leticia on the road past the airport, forest on N side of road, Finca Misiones, rain forest, 11 Feb 1971, *Kennedy* 813 (HOLOTYPE: GB; ISOTYPES: AAU, COL, DUKE, F, U, UBC). **T-Specimen:** COLOMBIA: Amazonas, Leticia, 8 km out of Leticia on the road past the airport, forest on N side of the road, Finca Misiones, rainforest, 11 Feb 1971, *Helen Kennedy* 813 (ISOTYPE: UBC-V204750).

Calathea tinalandia H. Kenn., *Canad. J. Bot.* 63:1141. 1985. **T-Protologue:** ECUADOR: Pinchincha, Tinalandia Hotel grounds, km 112 on the road Quito to Santo Domingo de los Colorados, tropical moist forest, ca. 700 m, 28 Jul 1982, *Kennedy* 4400 (HOLOTYPE: NY; ISOTYPES: AAU, GB, K, MO, QCA, SEL, U, UBC). **T-Specimen:** ECUADOR. PROV. PICHINCHA: Tinalandia Hotel grounds, km 112 on the road Quito to Santo Domingo de los Colorados, tropical moist forest, 28 Jul 1982, *Kennedy* 4400 (ISOTYPE: UBC-V183373).

Calathea utilis H. Kenn., *Nord. J. Bot.* 6:457. 1986. **T-PROTOLOGUE:** ECUADOR. PROV. NAPO: Sardinas, 6 km from Baeza on road to Lago Agrio, montane wet forest, 1900 m, 16 Jul 1982, *Kennedy, Besse, and Baker* 4363 (HOLOTYPE: MO; ISOTYPES: AAU, GB, K, NY, QCA, S, SEL, UBC). **T-Specimen:** ECUADOR. PROV. NAPO: 6 km from Baeza on the road to Lago Agria, Sardinas, montane W forest, 1900 m, 16 Jul 1982, *Helen Kennedy, Libby Besse, and Ray Baker* 4363 (ISOTYPE: UBC-V203560, 1 of 3; UBC-V218581, 2 of 3; UBC-V218582, 3 of 3).

Monophyllanthus araracuarenses S. Suárez, Galeano & H. Kenn., *Novon* 11:356. 2001. **T-Protologue:** COLOMBIA: Amazonas, río Caquetá, margen sur, Pena Roja, 0°39'S, 72°05'W, ca. 200 m, 9 Jun 1991, *G. Galeano, X. Martínez & S. Suárez* 2767 (HOLOTYPE: COAH; ISOTYPES: COL, MO, UBC). **T-Specimen:** COLOMBIA. DEPARTAMENTO DE AMAZONA: Pena Roja trocha al monte, en la margen sur del río Caquetá, 9 Jun 1991, *G. Galeano, X. Martínez, and S. Suárez* 2767 (ISOTYPE: UBC-V218577).

MELANTHIACEAE

Trillium ovatum Pursh forma **hibbersonii** T.M.C. Taylor & Szczaw., *Sysis* 7:250. 1974. **T-Protologue:** BRITISH COLUMBIA: W coast of Vancouver Island, near Boat Basin, Hesquiat Harbour, 49°20'N, 136°30'W, alt. 2000 ft, 1938, *J. Hibbersonii* s.n. (HOLOTYPE: UBC). **T-Specimen:** CANADA. BRITISH COLUMBIA: near Boat Basin, Hesquiat Harbour, W coast of Vancouver Island, 1938, *J. Hibberson* s.n. (HOLOTYPE: UBC-V73131).

POACEAE

Achnatherum wallowaensis J.R. Maze & K.A. Robson, Madrono 43:401. 1996. **T-Protologue:** U.S.A. OREGON. Wallowa Co.: Wallowa-Whitman National Forest, ca. 34 km N of Enterprise, near Boner Gulch along Forest Service Road 46, 45° 43' 41.16" N, 117° 08' 10.32" W (SW ¼ of SE ¼, section 24, T 3 N, R 45 E), 1481 m, 26 Jun 1993, *J. and E. Maze, K.A. Robson & T. Henn 1007* (HOLOTYPE: US; ISOTYPES: COLO, DAV, ID, NMC, OCS, UBC, UC, UTC, WTU). **T-Specimen:** U.S.A. OREGON. Wallowa Co.: Wallowa-Whitman National Forest, near Boner Gulch along Forest Service Road 46, ca. 34 km N of Enterprise, SW ¼ of SE ¼, section 24, T 3 N, R 45 E, plants growing in shallow rocky soil at 1279 m with *Bromus tectorum*, *B. japonicus*, *Blepharipappus scaber*, *Epilobium* sp., *Poa sandbergi*, *Danthonia intermedia*, *Agropyron spicatum*, *Lomatium macrocarpum*, *Sedum stenopetalum*, *Allium tolmei*, *Eriophyllum lanatum*, *Grindellia* sp., *Achillea millefolium*, 26 Jun 1993, *J. and E. Maze, K.A. Robson, and T. Henn 1007* (ISOTYPE: UBC-V209875).

Bromus ayacuchensis Saarela & P.M. Peterson, Sida 22:919. 2006. **T-Protologue:** PERU. DEPARTAMENTO AYACUCHO: Provincia Lucanas, 12 km E of Puquio on road towards Cuzco, (14°41'19.2 S Lat, 74°04'28.3 W Long), 3730 m, among large boulders with *Berberis* (Berberidaceae), above meadow with small creek, 11 Mar 2002, *P.M. Peterson 16452 & N.F. Refulio-Rodriquez* (HOLOTYPE: US; ISOTYPES: K, MO, UBC, USM). **T-Specimen:** PERU. DEPARTAMENTO AYACUCHO: Provincia Lucanas, 12 km E of Puquio on road towards Cuzco, (14°41'19.2 S Lat, 74°04'28.3 W Long), 3730 m, among large boulders with *Berberis* (Berberidaceae), above meadow with small creek, 11 Mar 2002, *P.M. Peterson 16452 & N.F. Refulio-Rodriquez* (ISOTYPE: UBC-V222906).

Elymus ambiguus Vasey & Scribn. var. **salmonis** C.L. Hitchc., Vasc. Pl. Pacific NorthW. 1:558. 1969. **T-Protologue:** IDAHO: Custer Co.: shale cliff 9 mi S of Challis, along E side of Salmon R., 31 May 1962, *Hitchcock & Muhlich 22305* (HOLOTYPE: UW). **T-Specimen:** IDAHO. Custer Co.: shale cliffs 9 mi S of Challis, along E side of Salmon River, 31 May 1962, *C.L. Hitchcock and C.V. Muhlick 22305* (ISOTYPE: UBC-V95381).

Oryzopsis swallenii C.L. Hitchc. & Spellensb., Brittonia 20:164. 1968. **T-Protologue:** IDAHO. Clark Co.: open sagebrush slope just N of Birch Creek, 2 mi NW of Blue Dome, along Highway 28, near the Lemhi Co. line, ca. 5600 ft, 7 Jul 1965, *C.L. Hitchcock 23868* (HOLOTYPE: WTU; ISOTYPE: US). **T-Specimen:** IDAHO. Clark Co.: open sagebrush slope N of Birch Creek, 3 mi NW of Blue Dome, elev. ca. 5600 ft, on decomposed limestone, semi-barren gentle slope with dwarfed sagebrush and very dwarfed *Oryzopsis hymenoides*; plants tufted, the herbarium specimens representing ca. 1/10-1/2 of the whole plant, 7 Jul 1965, *C.L. Hitchcock 23868* (ISOTYPE: UBC-V116845).

Paspalum eitenii Swallen, Phytologia 14:385. 1967. **T-Protologue:** BRAZIL: Maranhão, Município de Lorêto, “Ilha de Balsas” region, between Rios Balsas and Parnaíba, collected in ravine of dry brook in extensive “caatinga” forest, 6 Apr 1962, *George Eiten and Liene T. Eiten 4091* (HOLOTYPE: US). **T-Specimen:** BRAZIL: Maranhão, Município de Lorêto, “Ilha de Balsas” region, between the Rios Balsas and Parnaíba, ca. 30 km S of Loreto, ca. 0.5 km N of main house of Faz. São Raimundo on trail to Fazenda Santa Rita, ca. 7°19'S, 45°7-8'W, in ravine of now dry brook in extensive “caatinga” forest, soil light brown fine sand with clay, 200-300 m, 6 Apr 1962, *George Eiten and Liene T. Eiten 4091* (ISOTYPE: UBC-V117490).

POLYGONACEAE

Dedeckera eurekaensis Reveal & J.T. Howell, Brittonia 28:246. 1976. **T-Protologue:** UNITED STATES. CALIFORNIA. Inyo Co.: Last Chance Range, in a rocky canyon ca. 3 airline mi (4.8 km) SE of Eureka Valley sand dunes and 3.5 airline mi (5.6 km) NW of Marble VABM 7559, in T10S, R40E, on steep limestone, N-facing, rocky slopes in the canyon, associated with *Atriplex*, *Eriogonum* and *Prunus* at ca. 4000 ft (1200 m) elev., 29 Jul 1975, *J. L. Reveal, M. C. DeDecker & P. W. DeDecker 3909* (HOLOTYPE: US; ISOTYPES: 35 to be distributed). **T-Specimen:** CALIFORNIA. Inyo Co.: Last Chance Range, along the jeep corridor between Saline Valley and Eureka Valley, ca. 3 airline mi SE of Eureka Valley sand dunes and 3.5 airline mi NW of Marble VABM 7559, in T.10S., R.40E., on steep limestone, N-facing rocky slopes associated with *Atriplex*, *Buddleja*, *Prunus* and *Eriogonum*, at ca. 4000 ft elev., 29 Jul 1975, *James L. Reveal, Mary C. DeDecker, and Paul. W. DeDecker 3909* (ISOTYPE: UBC-V173364).

Eriogonum natum Reveal, Great Basin Naturalist 35:363. 1975. **T-Protologue:** UTAH. Millard Co.: along U.S. Highway 50-6, 46.2 mi E of the Nevada state line and ca. 43 mi W of Delta, on low white alkaline clay outcrops 50-300 meters N of the highway, ca. 0.2 mi E of the dirt road junction to the Antelope Spring-Black Hill Well roads, NNW of Sevier Lake, 13 Aug 1975, *Reveal & Reveal 3924* (HOLOTYPE: US; ISOTYPES: ARIZ, ASU, BRY, CAS, COLO, GH, ISC, K, MARY, MO, NY, OKL, OSC, PH, RM, RSA, SMU, TEX, UC, UTC, WTU). **T-Specimen:** UTAH. Millard Co.: along U.S. Highway 50-6, 46.2 mi E of the Nevada State line and ca. 43 mi W of Delta, ca. 0.2 mi E of the dirt road junction of Antelope Spring and Black Hill Well with the highway NNW of Sevier Lake, 13 Aug 1975, *James L. Reveal and Mark L. Reveal 3924* (ISOTYPE: UBC-V173366).

Eriogonum umbellatum Torr. var. **furcosum** Reveal, Great Basin Naturalist 45:278. 1985. **T-Protologue:** CALIFORNIA. El Dorado Co.: along California Highway 89, 2.2 mi S of U.S. Highway 50, on sandy granitic soil, associated with *Arctostaphylos*, *Artemisia*, and juniper-pinyon, 23 Aug 1975, *Reveal 3971* (HOLOTYPE: US; ISOTYPES: ARIZ, BRY, CAS, DUKE, F, GH, K, MARY, MEXU, MICH, MO, NY, OKL, RENO, RM, RSA, TEX, UC, UTC and elsewhere). **T-Specimen:** CALIFORNIA. El Dorado Co.: along California Highway 89, 2.2 mi S of U.S. Highway 50, on sandy granitic soils just E of the highway, associated with *Artemisia*, pinyon-juniper, and *Arctostaphylos*, 23 Aug 1975, *James L. Reveal 3971* (ISOTYPE: UBC-V173374).

POLYPODIACEAE

Pellaea gastonyi Windham, Contr. Univ. Michigan Herb. 19:36. 1993. **T-Protologue:** CANADA: BRITISH COLUMBIA: Kinbasket Mountain by Kinbasket River, NW of Golden, 17 Aug 1953, *Calder and Savile 11976* (HOLOTYPE: US; ISOTYPES: DAO, UBC, WTU). **T-Specimen:** CANADA. BRITISH COLUMBIA: Kinbasket Mountain by Kinbasket River, NW of Golden, very common in rock crevices, rocky gullies and slopes at base of mountain, 17 Aug 1953, *J.A. Calder and D.B.O. Savile 11976* (ISOTYPE: UBC-V75464).

Polypodium montense F.A. Lang, Madrono 20:57. 1969. **T-Protologue:** BRITISH COLUMBIA: Cheakamus River, *Lang 211* (HOLOTYPE: UBC). **T-Specimen:** BRITISH COLUMBIA: Basalt Columns at McGuire, Cheakamus River, in crevices in basalt, 50°N, 123°W, $2n = 74$, 6 Nov 1964, *F.A. Lang 211-B* (HOLOTYPE: UBC-V137746; ISOTYPES: UBC-V137749, UBC-V137745).

Polystichum kwakiutlii D.H. Wagner, Amer. Fern J. 80:50. 1990. **T-Protologue:** CANADA. BRITISH COLUMBIA: coast, Alice Arm, 10-9-(19)34, *A.D. York s.n.* (HOLOTYPE: UBC). **T-Specimen:** CANADA. BRITISH COLUMBIA: coast, Alice Arm, 10-9-1934, *A.D. York s.n.* (HOLOTYPE: UBC-V4859).

PORTULACACEAE

Claytonia perfoliata Donn ex Willd. var. **angustifolia** Greene, Fl. Francisc. 2:179. 1891. **T-Protologue:** U.S.A. CALIFORNIA: Santa Clara Co.: foothills near Stanford University, 1 Apr 1902, *C.F. Baker 487* (NEOTYPE: NDG [designated by Miller and Chambers, Syst. Bot. Mongr. 78:120. 2006]; ISONEOTYPES: CAN; CAS; DS; F; GH; LL; MICH; MO; NY; POM; UBC; UC; WIS). **T-Specimen:** CALIFORNIA. Santa Clara Co.: foothills near Stanford University, 1 Apr 1902, *C.F. Baker 487* (ISONEOTYPE: UBC-V34942).

PTERIDACEAE

Adiantum pedatum L. var. **rangiferinum** E .S. Burgess, Proc. & Trans. Roy. Soc. Canada 4, Sect. 4:11. 1886. **T-Protologue:** ...on thickly shaded rocks overhanging the waters of Gold Stream, at the base of Mount Finlayson, twelve mi from Victoria, B.C., *J.R. Anderson s.n.* (HOLOTYPE: not specified). **T-Specimen:** Goldstream [sic], rocky streams, *J.R. Anderson s.n.* (ISOTYPE: UBC-V4181).

RANUNCULACEAE

Delphinium caprorum Ewan, Bull. Torrey Bot. Cl. 69:145. 1942. **T-Protologue:** WASHINGTON: Cascade Mts., from Goat Rocks, 7000 ft, *J.W. Thompson 15206* (HOLOTYPE: COLO; ISOTYPES: to be distributed; US*). **T-Specimen:** WASHINGTON. Lewis Co.: Cascade Mountains, alpine rock slides on Goat Rocks, 7000 ft, *J. William Thompson 15206* (ISOTYPE: UBC-V46005).

Aconitum variegatum L. subsp. **variegatum** var. **carniolicum** Starm., Fritschiana 10:1. 1997. **T-Protologue:** Slowenien, Krain, ENE Laibach (Ljubljana), etwa 3 km NW Sagor (Zagorje), im Tal vom Kotredesch-Bach (Kotredeščica) E der Ruine Gallenberg (Gamberk), 460 m, GF 9855/2 Gebüsch, 31 Aug 1996, *A. Podobnik s.n.* (HOLOTYPE: LJU; ISOTYPES: CL, GJO, GZU, IBF, JACA, KL, KRA, LE, LI, LG, LJM, M, MEL, NY, OSC, PE, Herb. Podobnik, Herb. Starmühler, TBI, TNS, TK, W, WU, Z). **T-Specimen:** Slowenien, Krain, ENE Laibach (Ljubljana), etwa 3 km NW Sagor (Zagorje), im Tal vom Kotredesch-Bach (Kotredeščica) E der Ruine Gallenberg (Gamberk), 460 m, 31 Aug 1996, *A. Podobnik s.n.* (ISOTYPE: UBC-V222228).

ROSACEAE

Crataegus atrovirens J.B. Phipps & O’Kennon, Sida 20:141. 2002. **T-Protologue:** CANADA. BRITISH COLUMBIA: Northern Okanagan, Spallumcheen Municipality, Otter Lake Cross Road, 22 Aug 2000, *J.B. Phipps 8171 & S.R. Phipps* (HOLOTYPE: UWO; ISOTYPES: BRIT, CAN, MO, TRT, UBC, US). **T-Specimen:** CANADA. BRITISH COLUMBIA: N Okanagan, Spallumcheen Municipality, Otter Lake Cross Rd., E side, ca. quarter mi S of Hales Rd., roadside hedge under natural trees, 1300 ft, 50°22.5'N 119°13'W, 22 August 2000, *J.B. Phipps and S.R. Phipps 8171* (ISOTYPE: UBC-V217344).

Crataegus castlegarensis J.B. Phipps & O’Kennon, Sida 20:121. 2002. **T-Protologue:** UNITED STATES. IDAHO. Lemhi Co.: US 93, E side, 14.5 rd. mi N of Salmon, roadside ditch next to irrigated field, alt. ca. 3950 ft, bush, 5 m tall, foliage dull, dark, coriaceous, fruit strongly clustered, red-burgundy, with short pedicels, 20 Aug 1996, *J.B. Phipps & O’Kennon 7396* (HOLOTYPE: UWO; ISOTYPES: BRIT, CAN, MO, MONTU, TRT, UBC, V, WS). **T-Specimen:** IDAHO. Lemhi Co.: US 93, 14.5 rd mi N of Salmon, E side, roadside ditch next to irrigated field, ca. 3950 ft, 45°22'N 113°57½'W, 20 Aug 1996, *J.B. Phipps and R.J. O’Kennon 7396* (ISOTYPE: UBC-V217347).

Crataegus enderbyensis J.B. Phipps & O’Kennon, Sida 20:136. 2002. **T-Protologue:** CANADA. BRITISH COLUMBIA: just E of Enderby after bridge over Shuswap R., S side of road, rough grass near water; alt. ca 1250 ft, large bush 5 m tall, burgundy-red fruit, 25 Sept 1993, *J.B. Phipps & R.J. O’Kennon 6808* (HOLOTYPE: UWO; ISOTYPES: BRIT, CAN, DAO, UBC). **T-Specimen:** CANADA. BRITISH COLUMBIA: just E of Enderby after bridge over Shuswap River, rough grass near water, S side of road, ca. 1250 ft, 50°33'N 119°08'W, 25 Sep 1993, *J.B. Phipps and R.J. O’Kennon 6808* (ISOTYPE: UBC-V217345).

Crataegus okanaganensis J.B. Phipps & O’Kennon, Sida 18:178. 1998. **T-Protologue:** CANADA. BRITISH COLUMBIA: rough grass with hawthorns on Hwy. 97 near entrance to Kelowna airport, alt. 1800 ft, equals JBP 6907, bush, 4 m tall, 17 Aug 1994, *Phipps, J.B., & O’Kennon, R.J. 6974* (HOLOTYPE: UWO; ISOTYPES: CAN, TRT, UBC, US). **T-Specimen:** CANADA. BRITISH COLUMBIA: rough grass with hawthorns on Hwy. 97 near entrance to Kelowna airport, 1800 ft, 119°24'W 49°53'N, equals JBP 6907, bush 4 m tall, 17 Aug 1994, *J.B. Phipps 6974 & R.J. O’Kennon* (ISOTYPE: UBC-V213139).

Crataegus okanaganensis J.B. Phipps & O’Kennon var. **wellsii** J.B. Phipps & O’Kennon, Sida 20:132. 2002. **T-Protologue:** U.S.A. WASHINGTON. Okanogan Co.: Palmer Lake, N side; large bush, 5 m tall, (equals *J.B.P. & R.J.O’K. 6875*), 4 May 1994, *J.B. Phipps 6905* (HOLOTYPE: UWO; ISOTYPES: BRIT, CAN, DAO, UBC, US, WS). **T-Specimen:** WASHINGTON. Okanogan Co.: Palmer Lake, N side, open hawthorn thicket at upper level of pebble beach at picnic/campsite, just E of Chopata Lodge, 1150 ft, 119°37'W 48°54'N, 4 May 1994, *J.B. Phipps 6905* (ISOTYPE: UBC-V217342).

Crataegus orbicularis J.B. Phipps & O’Kennon, Sida 20:138. 2002. **T-Protologue:** CANADA. BRITISH COLUMBIA: Northern Okanagan, Spallumcheen Municipality, Back Enderby Rd., ca. 4 mi SE of Enderby, ca. 200 m N of creek crossing, alt. ca. 1450 ft, dense hedges E side of road, bush 4 m tall, 21 Aug 1994, *J.B. Phipps & R.J. O’Kennon 7039* (HOLOTYPE: UWO; ISOTYPES: BRIT, CAN, MO, TRT, UBC). **T-Specimen:** CANADA. BRITISH COLUMBIA: ‘Back Enderby’ Rd, ca. 4 mi SW of Enderby, ca. 200 m N of creek crossing, ca. 1450 ft, 119°07'W 50°31'N, 21 Aug 1994, *J.B. Phipps and R.J. O’Kennon 7039* (ISOTYPE: UBC-V217343).

Crataegus shuswapensis J.B. Phipps & O'Kennon, Sida 20:128. 2002. **T-Protologue:** CANADA. BRITISH COLUMBIA: Northern Okanagan, Enderby, ca. 200 m E of bridge over Shuswap River on Mabel Lake Rd., bush, 3.5 m tall, fruit deep purple (=JBP 6910), 20 Aug 1994, J.B. Phipps & R.J. O'Kennon 7009 (HOLOTYPE: UWO; ISOTYPES: BRIT, CAN, DAO, TRT, UBC). **T-Specimen:** CANADA. BRITISH COLUMBIA: ca. 200 m E of bridge over Shuswap River on road Enderby to Mabel lake, N side of road, edge of swampy woods, 1250 ft, 119°08' W, 50°33'N, 20 Aug 1994, J.B. Phipps and R.J. O'Kennon 7009 (ISOTYPE: UBC-V217346).

SAXIFRAGACEAE

× **Heuchera easthamii** Calder & Savile, Brittonia 11:54. 1959. **T-Protologue:** BRITISH COLUMBIA: 14 mi N of Hazelton, edge of thicket by Kispiox River, 19 Aug 1954, Calder, Savile & Ferguson 14748 (HOLOTYPE: DAO). **T-Specimen:** CANADA. BRITISH COLUMBIA: at bridge crossing Kispiox River 8 mi by road N of Kispiox village, N of Hazelton, 19 Aug 1954, J.A. Calder, D.B.O. Savile, and J. M. Ferguson 14748 (ISOTYPE: UBC-V72935).

Saxifraga codyana Zhmylev, Byull. Moskovsk. Obshch. Isp. Prir. Otd. Biol. 97:95. 1991. **T-PROTOLOGUE:** YUKON TERRITORY: British Mts., tributary of Fith [sic] R., 69°07'N, 140°15'W, N271667, Jul 1980, W. J. Cody 27166 (HOLOTYPE: DAO; ISOTYPE: MW). **T-Specimen:** CANADA. Yukon Territory, British Mountains, tributary of Firth River, 69°07'N, 140°15'W, 7 Jul 1980, W. J. Cody 27166 (ISOTYPE: UBC-V212762).

Saxifraga taylori Calder & Savile, Brittonia 11:248. 1959. **T-Protologue:** BRITISH COLUMBIA: Queen Charlotte Islands, Mt. de la Touche near head of Fairfax Inlet, Tasu Sound, Calder & Taylor 23511 (HOLOTYPE: DAO). **T-Specimen:** CANADA. BRITISH COLUMBIA: Queen Charlotte Islands, below Mt. de la Touche near head of Fairfax Inlet, Tasu Sound, W coast of Moresby Island, very common on boulders on coarse talus slope and rock slides from 1400'-2000', rare on cliffs, 16-17 Aug 1957, J.A. Calder and R. L. Taylor 23511 (ISOTYPE: UBC-V124231).

SCROPHULARIACEAE

Castilleja praeterita Heckard & Bacig., Madrono 4:209. 1970. **T-Protologue:** CALIFORNIA. Tulare Co.: N edge of Horse Meadow on Salmon Creek, ca. 7 air mi E SE of Fairview, southern Sierra Nevada, elev. 7400 ft, 10 Aug 1966, Bacigalupi and Heckard 9190 (HOLOTYPE: JEPS; ISOTYPES: to be distributed). **T-Specimen:** CALIFORNIA. Tulare Co.: edge of Horse Meadow, ca. 10 air mi NE of Kernville, 7400 ft, 10 Aug 1966, Rimo Bacigalupi and L.R. Heckard 9190 (ISOTYPE: UBC-V206957).

THYMELACEAE

Daphne × **mantensiana** J. Manten ex T.M.C.Taylor & Vrugtman, Bailey 12:39. 1964. **T-Protologue:** BRITISH COLUMBIA: Vancouver, garden of Mr. H. Eddie, 7 Aug 1963, F. Vrugtman 1644 (HOLOTYPE: UBC). **T-Specimen:** CANADA. BRITISH COLUMBIA: ex hort garden of Mr. H. Eddie, Vancouver, B. C., 49° 16 N, 126° 15 W, 7 Aug 1963, F. Vrugtman 1644 (HOLOTYPE: UBC-V115036).

VISCACEAE

Phoradendron insignis Steyerl., Bol. Soc. Venez. Ci. Nat. 26:415. 1966. **T-Protologue:** VENEZUELA: Estado Bolívar, vicinity of road campamento 150 at km 150 in valley of savanna of Río Uarama below Uarama-tepui, NE of Luepa, 1200 m, 9 Mar 1962, Julian A. Steyermark and Leandro Aristeguieta 59 (HOLOTYPE: VEN). **T-Specimen:** vicinity of road campamento 150 at km 150 in valley of savanna of Río Uarama below Uarama-tepui, NE of Luepa, 1200 m, 9 Mar 1962, Julian A. Steyermark and Leandro Aristeguieta 59 (ISOTYPE: UBC-V132586).

ADDITIONAL NOTES

Several UBC specimens are incorrectly labeled as isotypes:

A specimen [Heller 2818a (UBC-V181080)] of *Cibotium st.-johnii* Krajina var. *typicum* Krajina (Stud. Bot. Cechosl. 1:94. 1938) is labeled (as *C. st.-johnii*) as an isotype. This collection is listed in the protologue of *C. st.-johnii* as a paratype; the type specimen of *C. st.-johnii* is Krajina 26. No collections of Krajina 26 are present in UBC.

A specimen [St. John 20114 (UBC-V47651)] of *Cyrtandra calpidicarpa* (Rock) St. John & Storey (Occ. Pap. Bernice Pauahi Bishop Mus. 20:81. 1950) is labeled as an isotype. This name was a combination based on (the basionym) *Cyrtandra longifolia* Hbd. var. *calpidicarpa* Rock (Amer. J. Bot. 4:618. 1917), thus the UBC specimen (collected in 1940) is not an isotype because the basionym is based on a 1909 collection according to its protologue.

A collection (Runyon 2655) of *Cyperus aristatus* Rottb. var. *runyoni* O'Neill (Rhodora 44:56. 1942) in UBC is labeled isotype. According to the protologue, the type series for this taxon is based on Runyon 1933. Since the collection numbers differ, the UBC specimen is clearly not an isotype.

A specimen [J.W. Eastham s.n. (UBC-V26885)] of *Spiranthes romanzoffiana* Cham., collected on 18 Aug 1938 at Lucile Lake, Garibaldi, British Columbia, includes has a handwritten note: "Type collected at Unalaska presumably on Kotzebue 1st Voyage. Also found at Bantry Bay, Co. Cork, Ireland." Based on this information, this specimen has been confused in the UBC herbarium as a type specimen, but it clearly is not, as the species was described over a century earlier [Linnaea 3:32(-33). 1828].

A specimen (B. Boivin 6789, Loon Lake, district of North Battleford, Saskatchewan, 4 Aug 1949) with the name *Geum aleppicum* Jacq. var. *cuneatum* is labeled isotype; however, this variety was never published and is therefore a *nomen nudum*. According to online databases, duplicates of this collection (each also labeled as isotypes) are deposited in UC/JEPS and NY. There is also a duplicate labeled isotype in MO, as well as additional collections with this name (Joseph Rohrer, pers. comm.). Boivin (Phytologia 15:354. 1967), in a brief discussion of the taxonomic history and morphological variability of *Geum aleppicum* in the Canadian prairie provinces, noted "A substitute name was prepared in 1949 and used extensively on herbarium sheets but was never actually published because the reputed distinguishing characters proved to be elusive." Boivin unfortunately did not include the invalid name in his discourse, but it seems likely that he was referring to this collection of *Geum aleppicum* var. *cuneatum*, collected in the same year (by him) in which the substitute name was prepared.

APPENDIX 1
INDEX BY COLLECTORS AND NUMBER

Allen 9603	Kennedy, Besse, & Baker 4373
Ancuash 1142	Kennedy, Besse, & Baker 4383
Anderson s.n.	Kennedy, Besse, & Baker 4404
Bacigalupi & Heckard 9190	Kennedy, Hammel, & Solomon 4664
Baker 487	Koyama 11120
Baker 11307	Lane 44
Bayly 83	Lang 211
Boivin & Alex 10245	Liesner 15662
Boivin & Ledingham 14079	Liesner 25333
Boivin, Bernard, & Perron 12942	Lugo 1605
Calder & Savile 11976	Luther 800
Calder & Taylor 23511	Madison, Plowman, Kennedy, & Besse 4646
Calder, Savile, & Ferguson 14748	Madison, Plowman, Kennedy, & Besse 4949
Chambers 2868	Maze, Maze, Robson, & Henn 1007
Clokey 7514	Mori, Gracie, Croat, Maas, Maas, Pennington, & Reed 22909
Cody 27166	Murray & Murray 522
Constance 3895	Nagata 2886
Davis 422	Nelson 85
Eiten & Eiten 4091	Pearsall 2
Galeano, Martínez, & Suárez 2711	Pearsall 4
Galeano, Martínez, & Suárez 2767	Peterson & Refulio-Rodriquez 16452
Galeano, Martínez, & Suárez 2829	Phillips 2854
Harling & Andersson 11940	Phipps 6905
Harling & Anderson 17592	Phipps & O’Kennon 6808
Harling, Bohlin, Lindström, & Roth 19833	Phipps & O’Kennon 6974
Hibberson s.n.	Phipps & O’Kennon 7009
Hitchcock 23868	Phipps & O’Kennon 7039
Hitchcock & Muhlich 22305	Phipps & O’Kennon 7396
Joyal 1264	Phipps & Phipps 8171
Kennedy 808	Podobnik s.n.
Kennedy 813	Reveal 3971
Kennedy 1139	Reveal & Reveal 3924
Kennedy 4224	Reveal, DeDecker, & DeDecker 3909
Kennedy 4400	Schofield 1270
Kennedy 4555	St. John 25960
Kennedy & Andrews 1343	Steyermark & Aristeguieta 59
Kennedy & de Fátima Gomes de Souza 4696	Suksdorf 7452
Kennedy & de Fátima Gomes de Souza 4699	Thompson 15206
Kennedy & de Fátima Gomes de Souza 4700	van der Werff, Gray, & Tipas 12429
Kennedy & Hammel 4545	van der Werff, Gray, Tipas, & Campaña 12194
Kennedy, Andrews, & Dressler 1379	Vrugtman 1644
Kennedy, Besse, & Baker 4288	York s.n.
Kennedy, Besse, & Baker 4363	Zika 16611
Kennedy, Besse, & Baker 4368	

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